

What is claimed is:

1. A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

a) from 0 to 80 parts by weight of a polyamide selected from the group

consisting of PA6, PA66, PA6/66 and a mixture thereof;

b) from 0.05 to 100 parts by weight of a polyamine-polyamide copolymer

prepared from the following monomers:

α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight  $M_n$  of at least 146 g/mol, and

β) a polyamide-forming monomer selected from the group consisting of a lactam, a  $\omega$ -aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and

c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which is obtained from caprolactam and/or from a combination of hexamethylenediamine/adipic acid; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which is obtained from  $\omega$ -aminoundecanoic acid, laurolactam, a mixture of hexamethylenediamine

and 1,12-dodecanedioic acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, and/or a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid.

2. The composite according to Claim 1, wherein the molding composition of layer I comprises:

at least 0.5 part by weight of component a) and/or at least 0.5 part by weight of component b) and/or at least 0.5 part by weight of component c).

3. The composite according to Claim 1, wherein the molding composition of layer I comprises at least 10 parts by weight of component a) and/or at least 2 parts by weight of component b) and/or at least 10 parts by weight of component c).

4. The composite according to Claim 1, wherein the molding composition of layer I comprises at least 20 parts by weight of component a) and/or at least 5 parts by weight of component b) and/or at least 20 parts by weight of component c).

5. The composite according to Claim 1, wherein the molding composition of layer I comprises at least 30 parts by weight of component a) and/or at least 10 parts by weight of component b) and/or at least 30 parts by weight of component c).

6. The composite according to Claim 1, wherein the molding composition of layer I comprises at most 70 parts by weight of component a) or at most 80 parts by weight of component b) or at most 70 parts by weight of component c).

7. The composite according to Claim 1, wherein the molding composition of layer I comprises at most 60 parts by weight of component a) or at most 60 parts by weight of component b) or at most 60 parts by weight of component c).

8. The composite according to Claim 1, wherein the molding composition of layer I has not more than 40 parts by weight of component b).

9. The composite according to Claim 1, wherein the polyamine-polyamide

copolymer is obtained from 1 to 20% by weight of the polyamine.

10. The composite according to Claim 1, wherein the polyamine contains at least 8 nitrogen atoms.

11. The composite according to Claim 1, wherein the polyamine has a number-average molecular weight  $M_n$  of at least 500 g/mol.

12. The composite according to Claim 1, wherein the amino group concentration in the polyamine-polyamide copolymer is in the range from 100 to 2 500 mmol/kg.

13. The composite according to Claim 1, wherein the molding composition of layer I comprises a block copolymer formed from components a) and c).

14. The composite according to Claim 1, wherein the composite comprises at least one layer II obtained from a molding composition based on PA11, PA12, PA612, PA1012, and/or PA1212.

15. The composite according to Claim 1, wherein the composite comprises at least one layer III obtained from a molding composition based on PA6, PA66, and/or PA6/66.

16. The composite according to Claim 15, wherein the composite has the layer sequence I/III.

17. The composite according to Claims 14 or 15, wherein the composite has the layer sequence II/I/III.

18. The composite according to Claims 14 or 15, wherein the composite has a symmetrical structure and either has the layer sequence II/I/II or has the layer sequence II/I/III/I/II.

19. The composite according to Claim 1, wherein the composite also comprises a regrind layer.

20. The composite according to Claim 1, wherein the molding composition

comprises not more than 50% by weight of an additive.

21. The composite according to Claim 13, wherein the layer II is the outer layer.

22. The composite according to Claim 1, wherein one of the layers is electrically conductive.

23. The composite according to Claim 1, wherein an additional, electrically conductive layer is adjacent to an innermost layer.

24. The composite according to Claim 1, wherein the composite is a tube.

25. The composite according to Claim 24, wherein at least one region of the composite is corrugated.

26. The composite according to Claim 1, wherein the composite is a hollow article.

27. The composite according to Claim 1, wherein an elastomer layer is adjacent to the outermost layer.

28. The composite according to Claim 1, wherein the composite is a fuel piping, a brake-fluid piping, a coolant piping, a hydraulic-fluid piping, a fuel-pump piping, an air-conditioner piping, or a vapor line.

29. The composite according to Claims 26 or 27, wherein the composite is a container, or a filler pipe.

30. The composite according to Claim 1, wherein the composite is a film.

31. The composite according to Claim 1, wherein the composite is produced by multicomponent injection molding, coextrusion or coextrusion blow molding.

32. A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

- a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA6, PA66, PA6/66 and a mixture thereof;

b) from 0 to 100 parts by weight of a polyamine-polyamide copolymer

prepared from the following monomers:

α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight  $M_n$  of at least 146 g/mol, and

β) a polyamide-forming monomer selected from the group consisting of a lactam, a ω-aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and

c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which is obtained from caprolactam and/or from a combination of hexamethylenediamine/adipic acid; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which is obtained from ω-aminoundecanoic acid, laurolactam, a mixture of hexamethylenediamine and 1,12-dodecanedioic acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, and/or a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid;

wherein said polyamide a) and said polyamide c) are obtained by subjected a polyamide blend to solid-phase post-condensation.

33. The composite according to Claim 32, wherein a temperature of said solid-phase

post-condensation is from 140°C to about 5 K below a crystalline melting point  $T_m$  of the polyamides.

34. A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA6, PA66, PA6/66 and a mixture thereof;

b) from 0 to 100 parts by weight of a polyamine-polyamide copolymer prepared from the following monomers:

α) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight  $M_n$  of at least 146 g/mol, and

β) a polyamide-forming monomer selected from the group consisting of a lactam, a ω-aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and

c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which is obtained from caprolactam and/or from a combination of hexamethylenediamine/adipic acid; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which

is obtained from  $\omega$ -aminoundecanoic acid, laurolactam, a mixture of hexamethylenediamine and 1,12-dodecanedioic acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, and/or a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid;

wherein either polyamide a) or c) contains an excess of amino end groups and the other polyamide contains an excess of carboxyl end groups.

35. A composite having two or more layers and comprising:

a layer I obtained from a molding composition comprising:

- a) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA6, PA66, PA6/66 and a mixture thereof;
- b) from 0 to 100 parts by weight of a polyamine-polyamide copolymer prepared from the following monomers:
  - $\alpha$ ) from 0.5 to 25% by weight, based on the polyamine-polyamide copolymer, of a polyamine having at least 4 nitrogen atoms and having a number-average molecular weight  $M_n$  of at least 146 g/mol, and
  - $\beta$ ) a polyamide-forming monomer selected from the group consisting of a lactam, a  $\omega$ -aminocarboxylic acid, an equimolar combination of a diamine and a dicarboxylic acid and a mixture thereof; and
- c) from 0 to 80 parts by weight of a polyamide selected from the group consisting of PA11, PA12, PA612, PA1012, PA1212 and a mixture thereof;

wherein a total of the parts by weight of components a), b) and c) is 100;

wherein at least 20 parts by weight of components a) and b) is a monomer unit which

is obtained from caprolactam and/or from a combination of hexamethylenediamine/adipic acid; and

wherein at least 20 parts by weight of components b) and c) is a monomer unit which is obtained from  $\omega$ -aminoundecanoic acid, lauro lactam, a mixture of hexamethylenediamine and 1,12-dodecanedioic acid, a mixture of 1,10-decanediamine and 1,12-dodecanedioic acid, and/or a mixture of 1,12-dodecanediamine and 1,12-dodecanedioic acid;

wherein components a) and c) are linked by adding a reactive compound which links the polyamide end groups to one another.

36. The composite according to Claim 35, wherein said reactive compound is selected from the group consisting of a bisoxazoline, a biscarbodiimide, a bismaleimide, a bisanhydride, a diisocyanate and a mixture thereof.